HIGH-RESOLUTION LASER SPECTROSCOPY OF THE $S_1 \leftarrow S_0$ TRANSITION OF Cl-NAPHTHALENES

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High-resolution fluorescence excitation spectra of the $S_1 \leftarrow S_0$ electronic transition have been observed for 1-Cl naphthalene (1-ClN) and 2-Cl naphthalene (2-ClN). Sub-Doppler excitation spectra were measured by crossing a single-mode UV laser beam perpendicular to a collimated molecular beam. The absolute wavenumber was calibrated with accuracy 0.0002 cm^{-1} by measurement of the Doppler-free saturation spectrum of iodine molecule and fringe pattern of the stabilized etalon. For 2-ClN, the rotationally resolved high-resolution spectra were obtained for the 0_0^0 and $0_0^0 + 1042$ cm^{-1} bands, and these molecular constants were determined in high accuracy. The obtained molecular constants of the 0_0^0 band are good agreement with the ones reported by Plusquellic *et. al.* [a] For the $0_0^0 + 1042$ cm^{-1} band, the local energy shifts were found. On the other hand, for 1-ClN, the rotational lines were not fully resolved because the fluorescence lifetime is shorter than the one of 2-ClN. Then we determined the molecular constants of 1-ClN from the comparison the observed spectrum with calculated one.

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[a] D. F. Plusquellic, S. R. Davis, and F. Jahanmir, *J. Chem. Phys.*, **115**, 225 (2001).